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SPYRIDIUM TRICOLOR (RHAMNACEAE), A DISJUNCT NEW SPECIES FROM THE GREAT AUSTRALIAN BIGHT

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Abstract

This new species is described from Western Australia and South Australia from mallee vegetation on shallow soil overlying limestone. The occurrences in the two states are over 650 km apart and separated by the Nullarbor Plain. In comparison with other *Spyridium* species with the same fruit type, *S. tricolor* can be distinguished from its South Australian and eastern states congeners by the very large size of the stipule-like bracts which encircle the unit inflorescences, and amongst the Western Australian species by its almost circular leaves with flat to incurved rather than recurved margins.

On the basis of the collections in the State Herbarium of South Australia and the Western Australian Herbarium, the following species was first collected in South Australia in 1926 from Koonibba, near Ceduna on the eastern edge of the Great Australian Bight, and in Western Australia in 1966 from near Mt Ragged in Cape Arid National Park. It was recognised as distinct independently by the two authors.

Spyridium tricolor W.R. Barker & Rye, *species nova*

Spyridium spadiceum var. *calvescens* auct. non (Reiss.)Benth.: R.F. Parsons, Trans. Roy. Soc. S. Austral. 94 (1970) 239.

Spyridium spadiceum auct. non (Fenzl)Benth.: E.C. Nelson, J. Roy. Soc. W. Austral. 57 (1974) 110, partly (as to AD duplicates of *Parsons 144, 159, 190*).

Spyridium sp.: W.R. Barker in J.P. Jessop, List Vasc. Pl. S. Austral., edn 2 (1984) 38; W.R. Barker in J.P. Jessop, List Vasc. Pl. S. Austral., edn 3 (1989) 63

Species nova inter species orientales bracteis maximis brunneis circa fasciculos florum unica, inter species occidentales fructus eosdem ferentes foliis marginibus denique planis usque incurvatis differt.

Holotypus: *P.G. Wilson 5940*, 20.vii.1967, P[oin]t Dover, Great Australian Bight, Western Australia, PERTH. *Isotypi*: AD, CANB.

Erect dense rounded *shrub* 0.3-1.5 m high, with a persistent dense indumentum on the stems, rachises and leaves and leaf-like bracts on petioles and underside of the blade, consisting of antrorse to spreading wavy hairs c. 0.3 mm long, initially ferruginous, giving young branch tips a characteristic rusty appearance, turning grey. *Stipules* ovate, 3-5.5 mm long, caudate, keeled, dark brown soon turning dark grey, very shortly pubescent, mainly along midline towards base, persistent after leaves have shed, but with a fragile tip. *Leaves* with *petiole* 3-5 mm long; *blade* thick, at first conduplicate, at maturity almost flat but with the upper midrib impressed, broadly elliptic to circular, 8-13 × 7.5-12 mm, the base and apex rounded, sometimes slightly emarginate, the margins usually flat, sometimes incurved, the upper surface pale to mid green,

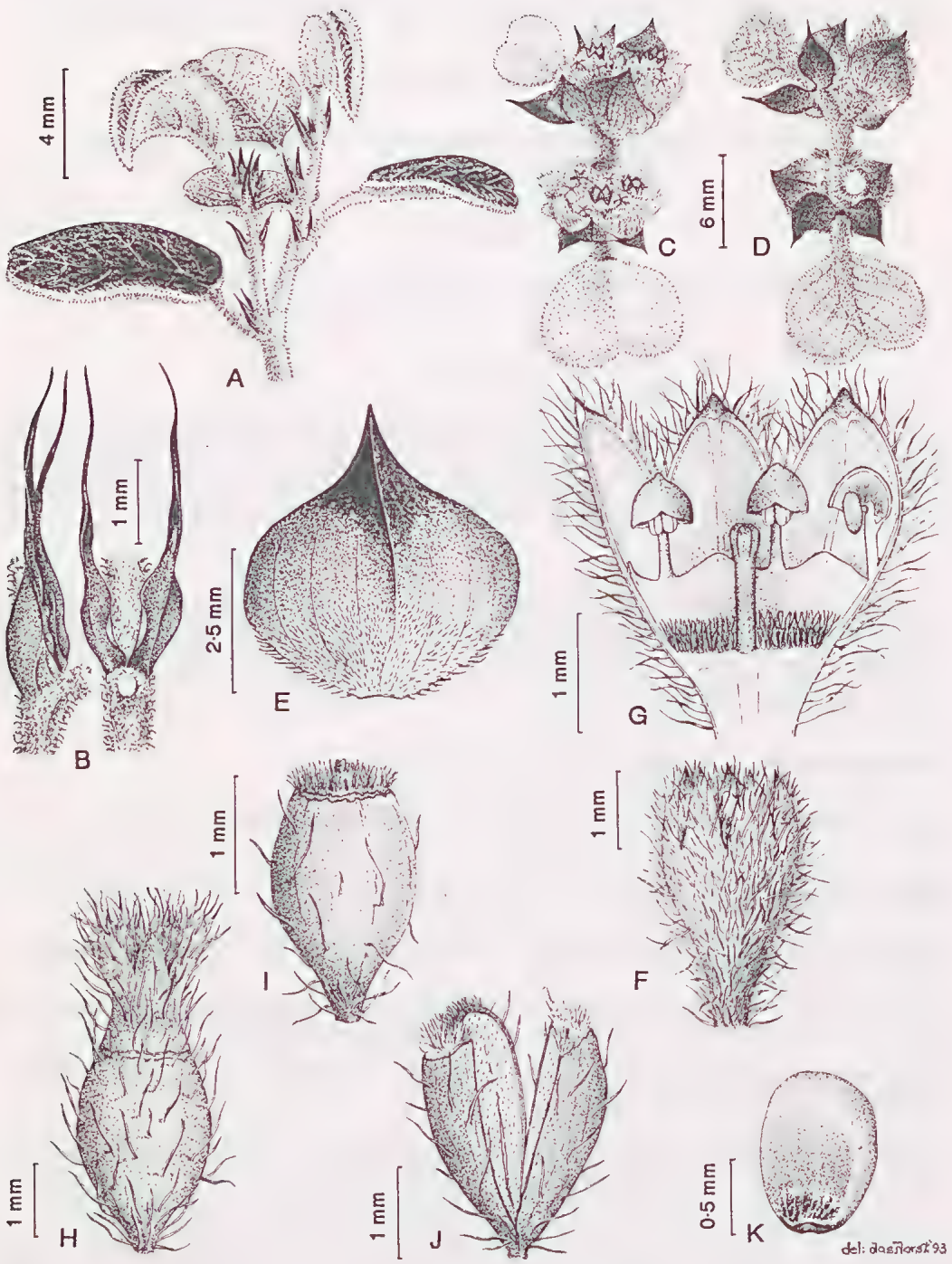

Fig. 1. *Spyridium tricolor.* A, branch apex; B, pair of stipules from side and below; C, compound inflorescence from above and, D, below; E, involucral bract; F, flower; G, flower in longitudinal section; H, I, fruit with perianth and with perianth detached; J, dehiscent fruit; K, seed. (A-B, *Croft 4*; C-G, *Royce 10095;* H-K, *Wilson 5940*)

appearing glabrous but with minute hairs c. 0.1 mm long, the lower surface with 4-6 lateral veins on each side. *Inflorescence* usually terminal, compound, on a once forked rachis, the forks bearing 1-3 dense unit inflorescences of 12-20 sessile to subsessile flowers and terminated by a bistipulate leaf-like bract densely cream tomentose above; *unit inflorescences* surrounded by an imbricate ring of involucral bracts; *involucral bracts* broadly or very broadly ovate, 4-6 mm long, acuminate, dark brown turning dark grey, pubescent like the stipules, often splitting and the tip breaking off as the buds and fruits develop. *Flower* densely tomentose; *floral tube* 1.2-1.5 mm long, with hairs antrorse, over 1 mm long; *sepals* ovate, 1-1.3 mm long, with spreading white hairs less than 1 mm long; *petals* c. 0.7 mm long, hooded, enclosing the anthers; *disc* adnate to the floral tube, glabrous, with 5 depressed ovate lobes c. 0.4 mm wide alternating with the stamens; *ovary* inferior, the flat summit densely covered with erect white hairs c. 0.5 mm long; *style* c. 1.5 mm long, glabrous, topped by 3 small stigmatic lobes. *Fruit* a schizocarp, obovoid and topped by the floral tube and perianth which apparently persist until dehiscence, dark brown, glabrous but for scattered deciduous hairs (originally on the base of the floral tube), white-pubescent on the finally exposed summit, splitting to the base into 3 1-seeded or infertile cocci; *cocci* compressed obovoid-ellipsoid, c. 2 mm long, apparently shed intact, the white papillose membranous wall with an adaxial longitudinal suture; *seed* compressed, broadly elliptic in outline, slightly curved so that concave in adaxial view, c. 1-1.4 × 0.8-1.2 mm, smooth, pale to mid yellow-brown, at the base black within showing through the hyaline testa: *caruncle* apparently absent. (Fig. 1).

Distribution & ecology

S. tricolor is known from two regions over 650 km apart on either side of the Great Australian Bight, separated by the Nullarbor Plain (Fig. 2). It extends from Cape Arid National Park north-eastwards to near Eyre in Western Australia, while in South Australia it is confined to locations in the vicinity of Koonibba which is about 25 km north-west of Ceduna on north-western Eyre Peninsula.

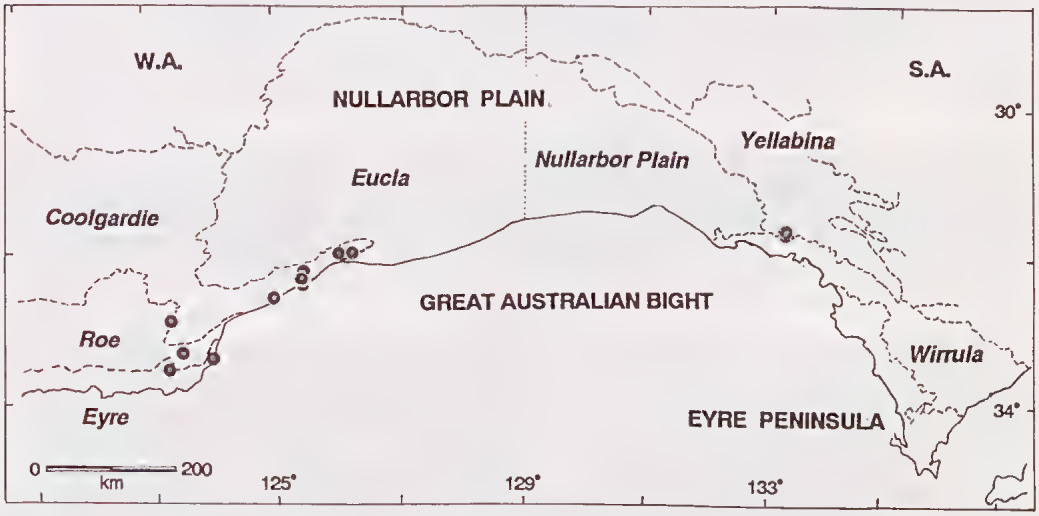

Fig. 2. Distribution of *Spyridium tricolor* in relation to the Beard (1980) phytogeographic regions of Western Australia and the Laut et al. (1977) environmental associations of South Australia. (These regions and associations are italicised).

In Western Australia populations appear to be restricted to sand, loam or sandy clay over limestone substrate; they are often noted as occurring in mallee communities, once (*Archer 1411927*) as localised with a *Triodia* sp.

In South Australia they apparently usually occur in similar habitats in the Wirrula Environmental Association of Laut et al. (1977; Fig. 2) on shallow sand to sandy loam over limestone rubble or sheets (calcrete), in *Eucalyptus dumosa* low open forest sometimes with *E. oleosa* (*Croft 3*), in broad openings of low open *Casuarina pauper - Myoporum platycarpum* woodland between denser mallee *Eucalyptus* woodland (*Croft 4*), and in *E. gracilis - E. oleosa* open scrub (*Croft AD 99050223*), this last extending into the adjacent Yellabina Association in *E. incrassata - E. yumbarrana* open scrub on red siliceous sand dunes.

Flowering occurs throughout the year.

Conservation status

Only two populations are known to exist today in South Australia, about 10 km apart, both NW of Ceduna in the Hundred of Catt and between Koonibba and Penong. These possibly come from the same general area as the only other records from the State over 60 years ago. Mr T. Croft (pers. comm., June 1993), who relocated the species, believes that it may be confined to the mallee vegetation restricted to this area which is characteristically richer than that further to the west. While finding over 50 plants at one location (*Croft AD 99050223*), at the other he saw only five plants despite a search (*Croft 3, 4*). It is possible that South Australian populations are under threat, but this can be confirmed only when the region is more closely surveyed. In the meantime the two areas where *S. tricolor* is known to exist have been placed under Heritage Agreements to prevent land clearance.

In Western Australia *S. tricolor* is apparently not threatened. At least ten populations are known, most occurring in conservation reserves. The species extends for over 300 km. The number of plants in each population has rarely been recorded, but populations with of the order of 100 or more plants occur north-west of Mt Ragged (*Archer 1411927*) and at Gegelup (G.P. Craig, pers. comm. June 1993).

Notes

The genus *Spyridium* and its closely allied genera are in need of revision (Barker 1987). Although *S. tricolor* appears to have no very close relatives, it clearly belongs to the genus *Spyridium*, matching the fruit type and other diagnostic characters that have generally been used to delimit the genus. However, it may be unique in the genus in that it appears a caruncle is either absent or atypically smooth. The limited availability of fruits (confined to the type) and their immaturity precluded further investigation.

Among the South Australian and eastern state species *S. tricolor* is readily separated by its very large brown bracts which encircle the units of the compound inflorescence. No other species approaches these in size. Among the Western Australian species with the same fruit type it can be distinguished by its almost circular leaves with margins flat to incurved rather than recurved. Most specimens of the new species in PERTH had been misidentified as *S. rotundifolium* F.Muell., a species which overlaps in range and has leaves and bracts of similar size. The resemblance is superficial, however, as *S. rotundifolium* appears to belong to a different genus; its fruit is of the type found in *Pomaderris*, being half-inferior and having cocci with a fenestre. It also differs in many other characters, including its recurved leaf margins and shortly but distinctly pedicellate flowers.

S. tricolor apparently joins taxa with a disjunct distribution between south-western and south-eastern Australia (Green 1965, Parsons 1969). While the intervening region has not been thoroughly surveyed, the complete absence of herbarium specimens from the environmental regions of Beard (1980) and Laut et al. (1977) which equate to the Nullarbor Plain (Fig. 2) indicate that the disjunction is likely to be real. Parsons (1970) and Nelson (1974) noted this species (confused with "*S. spadiceum*") as a component of the calcifuge flora of the Roe Plain, which forms a strip between the calcareous Nullarbor plateau and the coast and is isolated from similar floras west of the Nullarbor Plain. The Nullarbor Plain has acted as a barrier to migration by calcifuge species since the late Tertiary but may have been circumvented by migration to the south along a coastal plain exposed during extended periods of low sea levels (Nelson 1981).

Etymology

The epithet derives from the Latin *tres*, meaning three, and *color*, coloured, referring to the distinctly three-coloured leaves, the undersurface of which is initially ferruginous but becomes grey with maturity, contrasted with the pale to mid green upper surface visible once the young leaves have unfolded.

Specimens examined

WESTERN AUSTRALIA. EYRE: *G.F. Craig 2554*, 21.iv.1993, 'Gegelup' Lake, near Israelite Bay, PERTH.—ROE: *R.D. Royce 10095*, 4.xii.1971, W edge of Reserve, S of Mt Ragged, Balladonia Road, Cape Arid National Park, PERTH; *E. Wittwer 7392*, 17.i.1966, c. 6 miles SW of Mt Ragged, PERTH; *J.W. Wrigley 68 5273* , 1.xi.1968, 40 km toward Balladonia, from road camp, 144 km E of Esperance, PERTH (ex CBG).—COOLGARDIE: *W.R. Archer 1411927*, 14.xi.1992, ca. 55 km [N]NW of Mt Ragged, AD, PERTH; *M.J. Fitzgerald s.n.*, 24.viii.1983, 32.5 km S of Caiguna via Baxter's Memorial track, PERTH 01280082; *G.J. Keighery 7195*, 3.iv.1984, 10.2 km N Eyre, on top of Hampton Tableland, PERTH; *G.J. Keighery 7290, 7291*, 3.iv.1984, 10 km N Eyre on Hampton scarp face, PERTH; *G.J. Keighery & J.J. Alford 520*, 14.xii.1985, Toolinna Cove campsite, 73 km SW of Caiguna, PERTH; *R. Parsons 144*, 1.xii.1967, Ca. 18 km SSW of Cocklebiddy, AD (ex MELU); *R. Parsons 159*, 1.xii.1967, 23 km SSW of Cocklebiddy, AD (ex MELU); *R. Parsons 190*, 2.xii.1967, ca. 27 km S of Caiguna, AD (ex MELU); *P.G. Wilson 5940* (see Type citation); *E. Wittwer 1975*, 11.xi.1976, 17 km S Caiguna, on Baxter Memorial Road, PERTH.

SOUTH AUSTRALIA. EYRE PENINSULA: *J.B. Cleland s.n.*, 22.viii.1928, 8 miles W of Koonibba, AD96601630; *T. Croft 3*, 29.v.1991, eastern boundary of Section 15 Hundred of Catt, 16½ km NW of Koonibba, 2 km NE of White Well Corner, AD; *T. Croft 4*, 30.v.1991, Section 15 Hundred of Catt, 16½ km NW of Koonibba, 1½ km NNE of White Well Corner, AD, CANB, PERTH; *T. Croft s.n.*, 24.x.1990, northern part of Section 10, Hundred of Catt (northern boundary of Hundred), 23 km NE of Penong, AD 99050223; *Rev. C. Hoff s.n.*, viii.1926, Koonibba, AD97744369.

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